Memorandum

To: *Diane Salkie, EPA Region 2*
Elizabeth Franklin, USACE

From: *Troy Gallagher, CDM Smith*

Date: *December 17, 2019*

Subject: *Summary of Oversight of Chemical Water Column Monitoring*
December 4–5, 2019
Lower Passaic River Restoration Project

On behalf of the United States Environmental Protection Agency (EPA) and the United States Army Corps of Engineers (USACE), Kansas City District, CDM Federal Programs Corporation (CDM Smith) traveled to the Lower Passaic River Study Area (LPRSA) on Wednesday, December 4 through Thursday, December 5, 2019 and provided field technical oversight for the seventh round of surface water sampling associated with the Chemical Water Column Monitoring (CWCM) program.

Water sampling was conducted at 5 different locations along the Lower Passaic River at the following river mile (RM) locations: RM 8.4, RM 10.2, RM 12.0, RM 13.5, and RM 15.8. One sample was collected from RM 15.8 from a mid-depth of the river; for the remaining four locations, two samples were collected from each location, one from the top of the RM location approximately 3 feet below the surface, and the second from the bottom, approximately 2 feet above the river bottom. Samples were collected during both flood and ebb tides from each river mile station. Samples were collected using a peristaltic pump to pump water directly into the sample containers. Water quality parameters were collected, and a vertical profile was performed both before and after samples were collected. Field activities were conducted by Ocean Surveys, INC. (OSI) and AECOM on behalf of the Cooperating Parties Group (CPG). Anchor QEA, who typically provides field support on behalf of the CPG, was not present during this sampling event. Split samples were collected by CDM Smith on December 4, 2019.

The fixed point monitoring locations are presented in Figure 1 from the CPG's quality assurance project plan (QAPP). Oversight was conducted in accordance with CDM Smith's Final QPP for CWCM, dated September 3, 2019. Photographs of field activities are presented in Attachment 1. A copy of the field logbook notes is provided in Attachment 2. A copy of the sample tracking log is provided in Attachment 3.

Summary of Wednesday, December 4, 2019 Field Activities

Personnel in Attendance

Troy Gallagher – CDM Smith
Alexandra Allen – OSI
James Roth – OSI
Steve Howe – AECOM
Mike Tatarelli – AECOM

All personnel met at the 1 Madison Street boat dock in Rutherford, New Jersey. OSI, CDM Smith and AECOM rode in OSI's boat, which was equipped with equipment for sampling.

All personnel mobilized to RM 12.0 for the start of sampling during the flood tide. AECOM recorded water quality parameters from the YSI, and sample containers were labeled to prepare for collection; OSI collected a vertical profile of water quality parameters before sample collection as well. The peristaltic pump was turned on, and sample collection began from the bottom of the RM 12.0 location. After all sample containers were filled, the YSI was raised and tubing was replaced to begin collection from the top of the river. A final vertical profile of water quality parameters was collected, and the last water quality parameters were recorded. The vessel mobilized to the Madison Street boat dock to drop off full coolers from RM 12.0, and then mobilized to RM 13.5.

Upon arrival to RM 13.5, YSI water quality parameters were recorded by AECOM personnel, and sample containers were labeled to prepare for collection. A vertical profile of water quality parameters was collected before sample collection as well. The peristaltic pump was turned on, and sample collection began from the bottom of RM 13.5. CDM Smith collected a split sample and a duplicate sample from the bottom of RM 13.5 with the sample identification 19T-CE02-T135-BS-CDM and 19T-CE02-T135-BS-CDM-100, respectively. Sample containers were filled in an alternating pattern, filling one AECOM sample container and then one split sample container. After all sample containers were filled, the YSI was raised and the tubing was replaced to begin collection from the top of the river. Water quality parameters were recorded, and then the sample collection began. A final vertical profile of water quality parameters was collected, and water quality parameters were recorded after sample collection to complete sampling activities during the flood tide.

During the break between flood and ebb tides, Troy Gallagher packed all of the split sample containers in coolers and prepared them for shipment through FedEx. Surface water samples were sent to SGS AXYS laboratory to be analyzed for pesticides, PCBs, PAHs, and dioxin/furans; Katahdin Analytical Services was sent surface water samples to be analyzed for TOC, POC, TSS, total and dissolved metals, and total and dissolved mercury. Four coolers were dropped off at FedEx for overnight delivery. Troy Gallagher then returned onsite to oversee the ebb tide sampling.

Once the ebb tide had begun, the vessel mobilized to RM 15.8 to begin preparations for sampling. OSI collected a vertical profile of water quality parameters and AECOM recorded the water quality

parameters and labeled bottleware. Samples were collected from a mid-depth point of RM 15.8 during the ebb tide. A final vertical profile of water quality parameters was collected, and water quality parameters were recorded. The boat then departed RM 15.8 and headed to RM 12.0.

All personnel mobilized to RM 12.0 to for sample collection during the ebb tide. OSI collected a vertical profile of water quality parameters and AECOM recorded water quality parameters and labeled bottleware. Samples were first collected from the bottom of RM 12.0. The YSI was then raised to the surface, and the tubing was replaced. Water quality parameters were recorded, and the samples were collected from the surface of RM 12.0. A final vertical profile of water quality parameters was collected, and water quality parameters were recorded, and the boat then mobilized to RM 13.5.

All personnel mobilized to RM 13.5 to begin collecting the samples during the ebb tide. AECOM recorded water quality parameters from the YSI, and sample containers were labeled to prepare for collection; OSI collected a vertical profile of water quality parameters before sample collection as well. The peristaltic pump was turned on, and sample collection began from the bottom of the RM 13.5 location. After all sample containers were filled, the YSI was raised and tubing was replaced to begin collection from the top of the river. A final vertical profile of water quality parameters was collected, and the last water quality parameters were recorded, concluding the sampling activities for this day. The boat mobilized back to the dock and was secured for the evening.

Summary of Thursday, December 5, 2019 Field Activities

Personnel in Attendance

Troy Gallagher – CDM Smith
Alexandra Allen – OSI
James Roth – OSI
Steve Howe – AECOM
Mike Tatarelli – AECOM

All personnel met at the 1 Madison Street boat dock in Rutherford, New Jersey. OSI, CDM Smith and AECOM rode in OSI's boat, which was equipped with equipment for sampling.

All personnel mobilized to RM 10.2 to begin collecting the samples during the ebb tide. AECOM recorded water quality parameters from the YSI, and sample containers were labeled to prepare for collection. A vertical profile of water quality parameters was collected before sample collection as well. The peristaltic pump was turned on, and sample collection began from the bottom of the RM 10.2 location. After all sample containers were filled, the YSI was raised and tubing was replaced to prepare for collection from the top of the river. Water quality parameters were recorded, and then the sample collection began. A final vertical profile of water quality parameters was collected, and water quality parameters were recorded to finish up sampling activities at RM 10.2.

All personnel mobilized to RM 8.4 to collect samples for the ebb tide. AECOM recorded water quality parameters from the YSI, and sample containers were labeled to prepare for collection. A vertical profile of water quality parameters was collected before sample collection as well. The peristaltic pump was turned on, and sample collection began from the bottom of the RM 8.4 location. After all sample containers were filled, the YSI was raised and tubing was replaced to begin collection from the top of the river. Water quality parameters were recorded, and then the sample collection began. A final vertical profile of water quality parameters was collected to finish up sampling activities at RM 8.4. The boat mobilized to the Madison Street dock to wait on shore for the flood tide.

Once the flood tide had arrived, all personnel mobilized to RM 8.4 to begin collecting the samples during the flood tide. AECOM recorded water quality parameters from the YSI, and sample containers were labeled to prepare for collection. A vertical profile of water quality parameters was collected before sample collection as well. The peristaltic pump was turned on, and sample collection began from the bottom of the RM 8.4 location. After all sample containers were filled, the YSI was raised and tubing was replaced to begin collection from the top of the river. Water quality parameters were recorded, and then the sample collection began. A final vertical profile of water quality parameters was collected to finish up sampling activities at RM 8.4. The boat then mobilized to RM 10.2.

All personnel mobilized to RM 10.2 to begin collecting the samples during the flood tide. AECOM recorded water quality parameters from the YSI, and sample containers were labeled to prepare for collection. A vertical profile of water quality parameters was collected before sample collection as well. The peristaltic pump was turned on, and sample collection began from the bottom of the RM 8.4 location. After all sample containers were filled, including a field duplicate sample collected by AECOM, the YSI was raised and tubing was replaced to prepare for collection from the top of the river. Water quality parameters were recorded, and then the sample collection began. A final vertical profile of water quality parameters was collected to finish up sampling activities at RM 8.4. This completed all sample collection for the seventh round of the CWCM. The boat was taken back to the Madison Street dock and secured.

Figure 1

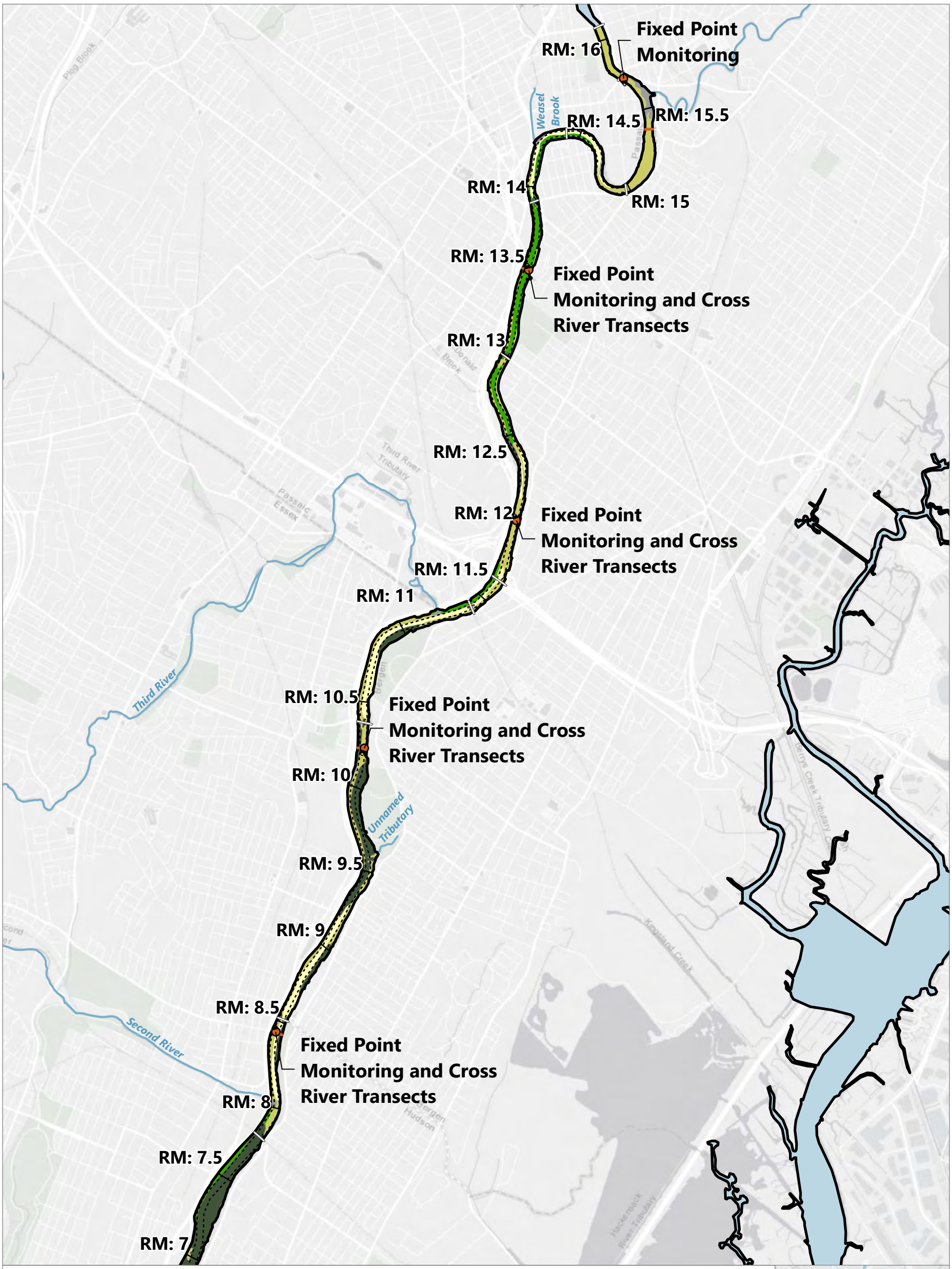

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Figure 1
Current Conditions Monitoring Locations
Field Sampling Plan Addendum
Current Conditions Monitoring Program - Physical Water Column Monitoring
Lower Passaic River Restoration Project

Attachment 1

Photographs of Field Activities

Photograph 1: OSI attaching tubing to YSI to prepare for vertical profile.

12/04/2019

Photograph 2: AECOM labeling sample containers prior to sample collection.

12/04/2019

Photograph 3: AECOM using peristaltic pump to collect surface water samples from RM 13.4.

12/04/2019

Photograph 4: AECOM filling amber jars using peristaltic pump.

12/04/2019

Photograph 5: OSI taping tubing to the YSI to prepare for a vertical profile.

12/05/2019

Photograph 6: AECOM collecting samples from RM 8.4.

12/05/2019

Photograph 7: OSI collecting vertical profile of water quality parameters from RM 10.2.

12/05/2019

Attachment 2

Field Logbook

Location Rutherford NJ Date 12/04/19

Project / Client LPR/USACE

Diamond alkali OU4 / CWCM

9¹⁵ TG arrives onsite.

Weather: 35°F, overcast

PPE: Level D, mustang suits

Purpose: CWCM 19T sampling, and split sampling collection.

9³⁰ H+S meeting conducted in B2 warehouse. Cold weather, crowded boat.

10⁰⁰ Depart Madison St dock and head to RM 12.0. Flood tide window open at 10²⁰. CDM Smith will collect split sample from RM 13.5

10¹⁰ Arrive @ RM 12.0. Setting up tubing on YSI, waiting for tide window to open.

10²⁰ Perform vertical profile. YSI tied off on bottom. Samples collected from bottom of RM 12.0, flood tide.

10⁴⁵ YSI raised. WQ parameters taken. Tubing replaced. Samples collected from top of RM 12.0 flood tide.

12/4/19

Location Rutherford NJ Date 12/4/19

Project / Client LPR / USACE

Diamond Alkali OU4 / CWCM

11⁰⁵ Final vertical profile and WQ parameters taken. Boat heads upto RM 13.5.

* Personnel: Troy Gallagher (CDM)
Mike Tatarelli } AECOM
Steve Howe }
Alex Allen } OSI
James Roth }

11³⁵ Arrive @ RM 13.5 after dropping RM 12.0 coolers off at dock. Vertical profile taken. WQ taken

11⁴⁵ Samples collected from bottom of RM 13.5. CDM splits also taken.

19T-CE02-T135-BS-CDM-

19T-CE02-T135-BS-CDM-100

Duplicate collected also "-100"

12²⁵ Raise YSI. Replace tubing. WQ taken. Samples collected from top of RM 13.5.

12⁴⁵ Raise YSI. WQ recorded and final vertical profile taken. Boat heads back to dock. TG will pack coolers for shipment during tide window break.

12/4/19

Rite in the Rain

Location Rutherford, NJ Date 12/4/19

Project / Client LPR / USACE

Diamond Alkali 004 / CWCM

15[00] TG drops 4 coolers off at FedEx. 2→5 GS, 2→ Katahdin. Heads back to Madison St dock for afternoon ebb tide

15[45] Board OSI vessel and head up to RM 15.8 to collect only ebb tide sample.

16[00] Arrive @ RM 15.8. Waiting for tide window to open

16[40] Vertical profile taken. WQ parameters recorded. Samples collected from mid-depth point (7.4') during ebb tide.

16[59] YSI raised. WQ recorded, Vertical profile taken. Boat heads to RM 12.0

17[33] Arrive @ RM 12.0. WQ and vertical profile taken. Samples collected from bottom of RM 12.0, ebb tide

18[00] Raise YSI. WQ parameters recorded. Samples collected from top of RM 12.0.

18[21] WQ + final vertical profile complete. Head up to RM 13.5

Location Rutherford NJ Date 12/4/19

Project / Client LPR / USACE

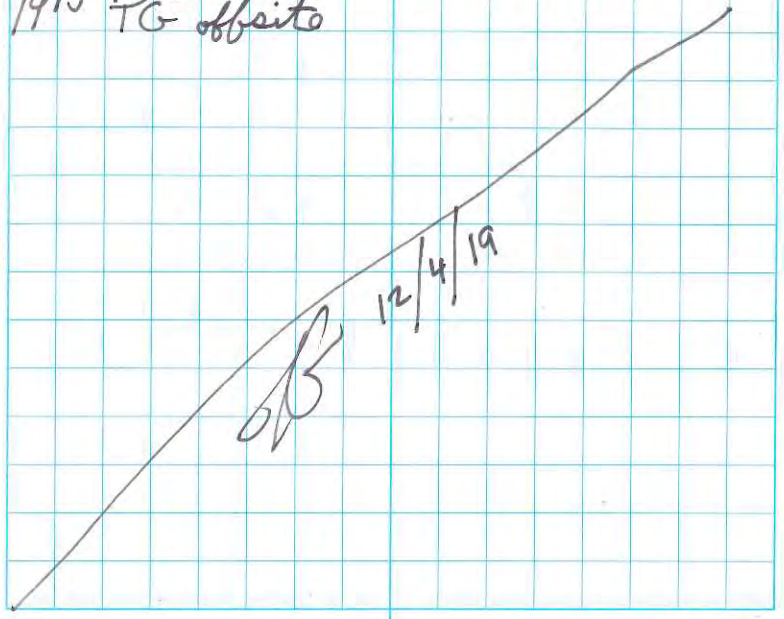
Diamond Alkali 004 / CWCM

18[34] Arrive @ RM 13.5. Set up tubing. Perform vertical profile + WQ parameters recorded. Samples collected from bottom @ RM 13.5, ebb tide.

19[00] WQ recorded. YSI raised + tubing replaced. Samples collected from top of RM 13.5, ebb tide.

19[11] Raise YSI and take WQ parameters and final vertical profile. Boat heads back to dock.

19[45] TG offsite



Location Rutherford, NJ Date 12/5/19

Project / Client LPR / USACE

Diamond Alkali OU4 / CWCM

4[15] TG onsite

Weather: 40°F, overcast

PPE: Level D, mustang suit

Purpose: Complete oversight of CWCM 19T event.

4[30] Meet crew on dock. Same crew as yesterday.

4[50] HTS meeting boat safety, icy conditions, cold weather. Leave dock and head downstream

5[15] Arrive @ RM 10.2. Set up tubing and YSI. Perform vertical profile.

5[25] WQ parameters recorded. Samples collected from bottom of RM 10.2, ebb tide.

5[40] Bring up YSI and change the tubing. WQ parameters recorded. Samples collected from top of RM 10.2, ebb tide

6[00] Final vertical profile and WQ parameters taken. Head to RM 8.4

6[20] Arrive @ RM 8.4. Take vertical profile. WQ recorded.

Location Rutherford NJ Date 12/5/19

Project / Client LPR / USACE

Diamond Alkali OU4 / CWCM

6[25] Samples taken from bottom of RM 8.4. ebb tide.

6[40] Raise YSI and replace tubing. WQ recorded. Samples collected from top of RM 8.4, ebb tide

7[00] Raise YSI. Final WQ and vertical profile taken. Boat heads back to dock to wait for flood tide window to open.

7[40] TG offsite to wait for next window

10[15] TG back onsite. Waiting for all personnel to arrive, then will leave for flood tide sampling.

10[40] Depart dock

11[20] Arrive @ RM 8.4. YSI set up and vertical profile completed.

11[25] Samples collected from bottom of RM 8.4, flood tide

11[35] WQ recorded. YSI raised and tubing changed.

11[45] Samples collected from top of RM 8.4, flood tide.

11[55] WQ recorded. Final vertical profile. Boat moves to RM 10.2.

12/5/19

Location Rutherford, NJ Date 12/5/19

Project / Client LPR / USACE

Diamond Alkali OU4 / CWCM

12⁰⁵ Arrive at RM 10.2. Set up YSI and tubing and label bottles

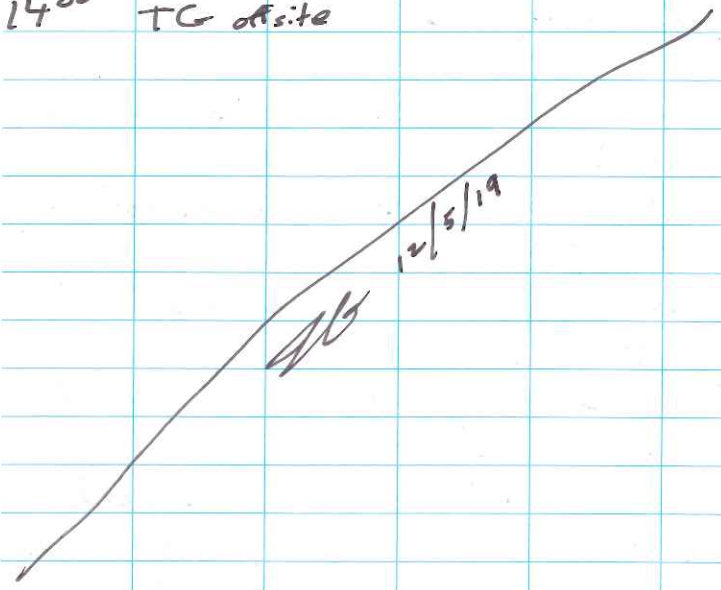
12¹⁵ WQ recorded. Samples collected from bottom of RM 10.2, flood. AECOM also collects duplicate from bottom.

12⁵⁰ YSI raised. WQ recorded. New tubing added.

12⁵⁵ Samples collected from top of RM 10.2, flood.

13¹⁰ Final WQ + vertical profile taken. Boat heads back to dock.

14⁰⁰ TG offsite



Location Rutherford NJ Date 12/10/19

Project / Client LPR / USACE

RM 10.9 SPME

11³⁰ TG onsite

Weather: 57°F light rain

PPE: Level D, tyvek

Purpose: Retrieval of pore water samplers from RM 10.9 cap.

11⁵⁰ AECOM personell onsite and begin unloading all equipment.

12⁰⁰ Scouting locations to see if samplers are exposed from the tide. H+S meeting on shore. Slips/trips/falls. Getting all equipment under canopy, heavy rain begins.

13⁴⁰ Bring all 3 samplers from 0603 back to shore. Spray them clean. Collect sediment sample from 0603 from surface muds, representative of top soil. Process: Armor layer sampler (green). Cut sampler open outside of screening range. Remove fibers from sampler, Cut fibers off, next to teflon tape, not from under tape. Rinse with DI water, to

Attachment 3

Sample Tracking Log

CWCM 7

SAMPLE TRACKING LOG

Trace VOC LAB: _____ INORGANIC CLP LAB: _____

CLP CASE NO: _____ ORGANIC CLP LAB: _____ SUBCONTRACT LAB: SGS AXYS

SAMPLE ID	SAMPLE DATE	SAMPLE TIME	MATRIX	DEPTH (feet)	Trace VOC CLP NO.	ORGANIC CLP NO.	INORGANIC CLP NO.	SUBCONTRACT ANALYSIS	QA/QC
19T-CE02-T135-BS-CDM	12/4/19	1045	SW	B	-	-	-	D/F, PCBs, Pest, PAHs	MS/MSD
19T-CE02-T135-BS-CDM-100	12/4/19	1045	SW	B	-	-	-	↓	Duplicate

ANALYSIS SUMMARY: D/F - Dioxin/Furan, PCB - polychlorinated biphenyls, Pest - organochlorine pesticides, PAHs - polycyclic aromatic hydrocarbons

CWCM #7

SAMPLE TRACKING LOG

Trace VOC LAB: _____ INORGANIC CLP LAB: _____

CLP CASE NO: _____ ORGANIC CLP LAB: _____ SUBCONTRACT LAB: Katahdin

SAMPLE ID	SAMPLE DATE	SAMPLE TIME	MATRIX	DEPTH (feet)	Trace VOC CLP NO.	ORGANIC CLP NO.	INORGANIC CLP NO.	SUBCONTRACT ANALYSIS	QA/QC
19T-CE02-T135-BS-CDM	12/04/19	1045	SW	B	–	–	–	SSC, POC/DOC, TAL Metals, Total Hg	MS/MSD
19T-CE02-T135-BS-CDM-100	12/04/19	1045	SW	B	–	–	–	↓	Duplicate

ANALYSIS SUMMARY: SSC - suspended solid concentration, POC/DOC - particulate organic carbon / dissolved organic carbon, TAL Metals - Total + dissolved metals, Total Hg - Total + dissolved mercury